



This is a list of documents published by Echelon that describe the technical aspects of LONWORKS™ technology. Some of these documents are included with the LONBUILDER™ 2.1 Developer's Workbench documentation. Documents marked with (*) are included in the LONBUILDER *Notes and News* binder.

To order, call 1-800-258-4LON from the USA and Canada and +1-415-855-7400 from elsewhere.

ENGINEERING BULLETINS

Title	Description
005-0001-01 Rev B(*) Enhanced Media Access Control with Echelon's LONTALK™ Protocol April 1992	An introduction to the LONTALK media access control (MAC) sublayer and an explanation of the CSMA algorithm used by the LONTALK protocol.
005-0002-01 How to use SNVTs in LONWORKS Applications	Defines simple guidelines for achieving interoperability in LONWORKS applications at the application layer of the LONTALK protocol using standard network variable types (SNVTs).
005-0003-01 (*) NEURON® CHIP Quadrature Input Function Interface	Describes the use of the quadrature device in the NEURON CHIP to interface to external devices such as shaft encoders.
005-0004-01 (*) Scanning a Keypad with the NEURON CHIP	Describes how the NEURON CHIP can be used to scan a simple 16-key switch matrix to provide a numeric or special-function keyboard without the use of a keyboard encoder.
005-0005-01 REV B(*) NEURON CHIP Performance using the Dhrystone C Benchmark March 1992	Describes porting a typical C benchmark program to NEURONC. Includes results obtained from compiling and executing the benchmark in comparison to another 8-bit microcontroller.
005-0006-01 (*) LONWORKS Installation Overview	Explains the various ways to install a LONWORKS network, i.e., assemble individual intelligent nodes into an interoperating network.
005-0007-01 Rev C (*) NEURON CHIP Input/Output Timing Specification April 1992	Describes the timing characteristics of the 24 I/O function blocks of the NEURON CHIP and the timing of the firmware I/O routines and the task scheduler.

005-0008-01 Rev B(*) RS-232C Serial Interfacing with the NEURON CHIP April 1992	Describes a simple level conversion circuit to allow the NEURON CHIP to communicate with RS-232C devices. Also includes NEURON C software to drive an RS-232C CRT terminal.
005-0009-01 (*) NEURON CHIP RS-485 Transceiver	Describes the implementation of a single-chip RS-485 network transceiver for use with the NEURON CHIP in a LONWORKS network.
005-0010-01 Rev A (*) LONTALK Response Time Measurements March 1992	Describes the throughput and response time results of experiments on LONTALK networks under varying conditions of load.
005-0011-01 (*) Optimizing LONTALK Response Time	Discusses the optional features and tunable parameters of the LONTALK protocol and their influence on the performance of a LONWORKS network.
005-0012-01 Rev B (*) Implementing Twisted-Pair Transceivers with NEURON CHIPS April 1992	Describes the communications port interface of the NEURON CHIP. Provides design guidelines for twisted-pair networks and specifications, schematics and parts lists for user-implemented twisted pair transceivers. Discusses implementation of link power.
005-0013-01 (*) NEURON 3150™ CHIP External Memory Interface	Describes interface and timing requirements for the memory bus of the NEURON 3150™ CHIP. Includes sample schematics and part numbers for interfacing EPROM, RAM and NVRAM.
005-0014-01 Rev B (*) Driving a Seven Segment Display with the NEURON CHIP April 1992	Describes how the NEURON CHIP can be used to drive a seven-segment display controller chip, the Motorola MC14489, using the Neurowire device. Includes NEURON C software drivers to display decimal numbers from binary data.
005-0016-01 Rev A Creating Applications with the LONBUILDER™ Multifunction I/O Kit April 1992	Describes how to use the the Multifunction I/O Kit product to develop NEURON CHIP application examples including bit I/O, Neurowire display device, quadrature shaft encoder input, frequency output and on-time input to measure temperature.
005-0017-01 Rev B (*) LONTALK Protocol April 1992	Summarizes the services available at each of the seven layers of the LONTALK Protocol included with every NEURON CHIP.
005-0019-01 Rev A Analog-To-Digital Conversion With the NEURON CHIP	Describes some of the more popular analog to digital (A/D) conversion schemes available for use with the NEURON CHIP. Provides schematics, parts lists and code examples.

LONWORKS Technical Documentation Index

005-0020-01 Rev A (*) NEURON CHIP Special-Purpose Mode Transceiver Interface Specification	Describes the development of custom network transceivers that use the special-purpose mode transceiver interface of the NEURON CHIP.
005-0021-01 Rev A (*) Parallel I/O Interface to the NEURON CHIP April 1992	Describes hardware and software to interface the NEURON CHIP to a host microprocessor using the parallel I/O port.
005-0022-01 Rev B (*) NEURON CHIP-based Installation of LONWORKS Networks April 1992	Describes five different scenarios for network management. Includes software examples of self-installing nodes and network management tools based on the NEURON CHIP platform.
005-0023-01 Rev A (*) Connecting and Wiring Guidelines for Typical Twisted Pair LONWORKS Networks April 1992, preliminary	Identifies the different types of junction boxes and interconnections that can be used in twisted pair LONWORKS networks in building and industrial control applications. Specifically discusses Pass-Thru, Stub Connectorized, Local Loop Connectorized, and Local Loop Terminal.
005-0024-01 Rev A (*) LONWORKS Custom Node Development April 1992	Describes steps needed to design and test a LonWorks custom node. Includes hints and advice to help speed the process of designing these nodes. Also lists pitfalls to avoid.
005-0031-01 Rev A NEURON Adapter Kit	Describes the NEURON Adapter Kit product which allows LONWORKS developers to quickly prototype custom products using NEURON CHIPS.

Other Documents Included with the LONBUILDER 2 Developer's Workbench

Note: Manuals are available for purchase at the indicated prices in US \$. (USA & Canada / International). Shipping and handling are additional. Other documents are free of charge.

Part Number and Title	Contents
29200 / 078-0001-01 LONBUILDER User's Guide (<u>\$75/\$90</u>) April 1992	Manual for developers on how to use the LONBUILDER Developer's Workbench to implement and manage LON applications.
29300 / 078-0002-01 NEURON C Programmer's Guide (<u>\$110/\$130</u>) April 1992	Manual describing how to write programs using the NEURON C programming language.

29100 / 078-0003-01 LONBUILDER Startup and Hardware Guide (<u>\$40/\$50</u>) April 1992	Manual describing the LONBUILDER Developer's Workbench hardware and installation, software installation, tutorial, product specifications and troubleshooting.
081-0003-01 Rev B Product Release Note April 1992	Lists new features, enhancements, known problems and documentation errata for LONBUILDER 2.1.
The SNVT Master List and Programmer's Guide March 1992	Lists and describes the Standard Network Variable Types that should be used to create interoperable LONWORKS nodes.
005-0018-01 Rev B (*) NEURON CHIP Advance Information April 1992	Data sheet describing the NEURON CHIP. Includes descriptions of the CPUs, memory subsystem, LONTALK protocol, network communications port, programming model, application I/O and additional functions. Includes pin assignment and pad layout, electrical and environmental specifications, NEURON CHIP configuration data structures and network management functions.
29900 / 081-0001-01 LONBUILDER Notes and News (\$25/\$30) April 1992	This binder contains the LONWORKS Solutions Roadmap, Engineering Bulletins marked with and *, Interoperability Guidelines, SNVT list, LONTALK Protocol engineering bulletins, and copies of the software licenses.
LONWORKS Solutions Roadmap April 1992	This 30 page document provides a detailed description of where to look for the answers to common LONWORKS questions.
078-0014-01 LONWORKS Interoperability Guidelines April 1992	Provides the guidelines that are the basis for obtaining the LONMARK™ logo, which indicates a product is LonWorks interoperable.

Documents included with LONMANAGER™ API for DOS

078-0008-01 / 39100 LONMANAGER API Programmer's Guide (<u>\$110/\$130</u>)	Manual for developers on how to use the LONMANAGER API for DOS to implement network management applications on MS-DOS computers.
058-0016-01 Rev C LONMANAGER API for DOS Release 2.1 Release Notes April 1992	Lists new features, enhancements, known problems and documentation errata for LONMANAGER API for DOS Release 2.1.

Other Echelon Manuals

078-0015-01A / 59100 LONWORKS Twisted Pair Control Module User's Guide April 1992	Provides specifications and user instructions for customers who have purchased any of Echelon's Twisted Pair Control Modules. These include the TP/XF-1250 Control Modules, TP/XF-78 Control Modules, and TP-RS485 Control Modules.
078-0016-01A/29400 LONWORKS Host Application Programmer's Guide May 1992	Shows developers how to create host applications for any host. Examples are shown in ANSI C; however, host applications may be written in any language that can implement the LONWORKS network interface protocol.
078-0017-01A/29500 LONWORKS Network Interface Developer's Guide May 1992	Manual for developers who are developing the following types of network interface applications: <ul style="list-style-type: none">• a generic LONWORKS network interface for use by others• a LONWORKS network interface for the user's own application
078-0018-01A/79100 LONWORKS Router and Repeater User's Guide June 1992	Provides specifications and user instructions for LONWORKS Routers and Repeaters. Discusses theory of operation and network management services for routers and repeaters.
078-0013-01A/79300 Serial LONTALK Adapter User's Guide June 1992	Provides specifications and user instruction for Serial LONTALK Adapter users. Provides a product description, lists installation instructions, and discusses the SLTA network drivers.

Product Data Sheets

003-0001-01	LONBUILDER Kits Summary
003-0003-01	LONBUILDER Processor Boards Summary
003-0004-01	LONBUILDER Twisted Pair Transceiver
003-0005-01	LONBUILDER Radio Frequency Transceiver
003-0013-01	LONBUILDER Multifunction I/O Kit
003-0014-01	LONMANAGER API for DOS
003-0015-01A - preliminary	LONWORKS Twisted Pair Control Modules
003-0016-01A - preliminary	LONWORKS Router Model 71000
003-0017-01A - preliminary	Microprocessor Interface Developer's Kit 23200
003-0019-01A - preliminary	Serial LONTALK Adapter Model 73000
003-0020-01A - preliminary	RF-10 Transceiver Module Model 50070

Miscellaneous

005-0015-01 LONBUILDER Configuration Guide	Sales memo describing options for configuring LONBUILDER Developer's Workbench systems
---	---

Echelon Corporation assumes no responsibility for any errors contained herein.
No part of this document may be reproduced, translated, or transmitted in any form without permission from Echelon.

© 1991, 1992 Echelon Corporation. ECHELON, LON, and NEURON are U.S. registered trademarks of Echelon Corporation. LONMANAGER, LONBUILDER, LONTALK, LONWORKS, 3150, and 3120 are trademarks of Echelon Corporation. Patented products. Other names may be trademarks of their respective companies. Some of the LONWORKS tools are subject to certain Terms and Conditions. For a complete explanation of these Terms and Conditions, please call 1-800-258-4LON.

Echelon Corporation
4015 Miranda Avenue
Palo Alto, CA 94304
Telephone (415) 855-7400
Fax (415) 856-6153

Echelon Europe Ltd
105 Heath Street
London NW3 8SS
England
Telephone (071) 431-1800
Fax (071) 794-0532
International Telephone + 44 71
431-1800
International Fax + 44 71 794-0532

Echelon Japan K.K.
AIOS Gotanda Building #808
10-7, Higashi-Gotanda 1-chome,
Shinagawa-ku, Tokyo 141, Japan
Telephone (03) 3440-8638
Fax (03) 3440-8639
International Telephone + 81 3 3440
8638
International Fax + 81 3 3440 8639